

SOIL CONSERVATION

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Terrace outlet channel in process of construction. Sod strips are to be placed in small transverse trenches.

DURING the past few years the attitude of those who use the land in America has undergone a remarkable change. Only a few years ago most of our farmers thought of soil erosion, if they thought of it at all, as an inevitable process of nature which caused them only inconvenience and irritation. They are now beginning to recognize that process as a very real peril to their own welfare, as well as that of the Nation, and to cope with it in a practical and effective manner.

roots of agriculture. America today has a sound foundation upon which to build for the future.

But the work of the Soil Conservation Service, and that segment of the C. C. C. which is engaged in soil conservation activity, has only begun. The task ahead, one that must be carried to successful completion if agriculture is to maintain its position in American life, is that of protecting all the land which needs protection from the wasteful and destructive effects of erosion. This in turn, because of the very vastness of our agricultural domain, cannot conceivably be accomplished for many years to come, nor can it be accomplished by any single agency, or group of agencies.

The task ahead is one that will require active soil-conservation effort on the part of all those who live on the land and use it for agricultural purposes. And recent events seem to indicate that American farmers are ready and willing to start on this undertaking.

During the past year a large number of States enacted soil-conservation districts laws which enable groups of farmers in natural land areas to form local organizations for purposes of soil defense. When organized, each district will have authority to carry

The Opportunity Broadens

By the Chief of the Soil Conservation Service

This change has been brought about, in part at least, by a national program of soil conservation. In this undertaking, the Civilian Conservation Corps, working hand in hand with the Soil Conservation Service, has played a tremendously important part. By showing, in terms of actual work upon the land, that erosion can be controlled and that land can be used profitably for agricultural purposes and at the same time preserved for the use of future generations, these agencies have imbedded the principles of soil conservation deep in the

on soil-conservation programs, and to accept technical and other assistance from those agencies which are prepared to extend such aid.

And as rapidly as districts are formed in those States which have suitable laws, the C. C. C. undoubtedly will be called upon to help the districts in planning and carrying forward their local programs. This single field today apparently offers the C. C. C. one of its greatest opportunities to perform services of lasting benefit to the Nation.

Youth and the Land

By Robert Fechner

Director, Civilian Conservation Corps



At work in a Soil Conservation Service nursery.

FOR many years before entering governmental work I had observed with growing concern the need for a conservation policy, and it was with deepest satisfaction that in 1933 I saw an aroused Government organize its forces to preserve natural resources. I was happy to have the privilege, through my connection with the C. C. C., of participating in the program.

When the Soil Conservation Service, now in the Department of Agriculture, was first established as the Soil Erosion Service under the Department of the Interior, a quarter of a million C. C. C. enrollees had already been working for a year on various programs of conservation. As director of the Civilian Conservation Corps I had been able to observe the tremendous benefits derived by the enrollees themselves from this type of work and at the same time to measure the progress of each program in actual work accomplishment. In 1 year, under the Park and Forest Service, enrollees had made commendable progress in rehabilitating forest areas, and I was convinced that through the Soil Conservation Service similar reclamation and conservation work could be extended to a much wider field. It was with enthusiasm, therefore, that I allocated C. C. C. camps to this Service, an activity which I believe to be one of the most valuable and interesting in which the Federal Government is engaged.

NOW, with 4 years of accomplishment to look back upon, it seems both desirable and fitting to review and evaluate the cooperative results so far obtained in this effort to save the soils of the country.

Created by act of Congress and with little precedent to guide it, the Civilian Conservation Corps came into existence when employment and discouragement were rife in the Nation. Bewildered youths, unable to obtain jobs, aimlessly plodded the highways from nowhere to nowhere. Likewise, the coming of the Soil

Conservation Service found farmers in many sections of the country discouraged by their inability to prevent destructive soil erosion on their farms.

In 4 years the Soil Conservation Service has given new hope to farmers in every section of the country, while the Civilian Conservation Corps has established in the minds of youths a new faith in government. Technicians of the Service have demonstrated, on farm and range, that much land can be reclaimed and that erosion can be controlled. Profitable crops are now harvested on farms that once were unproductive. The discouraged farmer who watched his fields slowly washing down the hill toward the river has been given assistance and shown how this can be prevented. Many ranges are once more green and adequately support the herds. Dust bowls are being "anchored," and soils that before only shifted aimlessly in the wind are in many areas again producing crops and pasturage.

TO accomplish this work, hundreds of thousands of unemployed and discouraged boys have been taken into C. C. C. camps as enrollees. Understanding guidance, good food, and healthy labor under advantageous conditions have rebuilt bodies and character. Hope and confidence have been reestablished and boys with new viewpoints have been sent out into the world better equipped to fight life's battles and win. Grateful citizens and organizations throughout the country attest the courage, willingness, and ambition of these boys. They needed only opportunity.

I am convinced that the education in the camps of young enrollees from rural areas is one of the most valuable features of the C. C. C. organization; and, while it is true that the boys in all groups receive excellent experience which will be of general value to conservation in years to come, probably the greatest benefits come to those who are enrolled in soil-conservation camps. These boys learn not only how to conduct practical and efficient soil-erosion preventive measures but they learn actually to do the work themselves. It is safe to assume that these boys will be impressed with the importance of this work, and that they will be able to arouse interest and concern among their families and neighbors when they return to their homes.

With the splendid results before me, I feel that it is a work that should go on. It has heartened the farmer. It has offered opportunity to the enrollee and has given those dependent upon him much needed assistance. But the job is not done, and I see no reason for curtailment in the name of economy a work too long delayed and which if stopped would strike at the very heart of our economic structure.

ON April 1, 1934, 22 Civilian Conservation Corps camps were assigned to the organization which later became the Soil Conservation Service. In less than 2 years, when the C. C. C. enrollment was at its peak, the number of camps had increased to more than 500. As limitations have since been placed on enrollment, the total has decreased until at the present time 361 camps are under the direct supervision of the Service.

Full responsibility for operation of these camps in the field is vested in the regional conservators, each of whom has a regional administrator, who with his assistants is directly responsible for C. C. C. administration. In order to ensure a coordinated work plan and to provide adequate technical direction, the camps are assigned to projects, the managers of which are responsible for outlining work programs. Each camp is under supervision of a superintendent, who has a staff of technicians and labor foremen to assist him. At the present time about 40 percent of the Service field personnel are C. C. C. employees, and a large majority of these men are located at camps directly engaged in planning and supervising the work of enrollees.

That the types of work required in soil conservation projects are well suited to the employment of enrollees is shown by the fact that during the fiscal year 1937 approximately 4 million acres of farm and range lands were treated by the camps. The nature of the work varies, of course, in different parts of the country; but this is also true, to a large extent, as regards the work between camps and even within each camp. A partial list of important operations which have been performed satisfactorily by enrollees in many parts of the country includes construction of terrace outlets and outlet structures, various forms of gully control, fence building, pasture sodding, seed collection, tree planting, nursery work, dam construction, stream-bank improvement, highway erosion-control demonstrations, construction of water spreaders, wind-erosion control, strip cropping, and improving wildlife habitats.

Erosion-control work is carried on by Soil Conservation Service C. C. C. camps in the same manner as on the watershed demonstration projects, the same type of cooperative agreement and identical conservation practices being used. While work has been demonstrational, it usually is not limited to a particular watershed area, although some of the camps are located on demonstration areas and others do considerable work on projects. Approximately 70 percent of the total acreage treated by the Service for the fiscal year 1937 was accomplished with camp labor.

C. C. C. Operations

By H. D. Abbott¹



Sloping sides of a recently excavated ditch preparatory to laying a rock masonry lining.

This coordination of the work of the camps with its regular program has enabled the Service to demonstrate a sound erosion control program to a vastly greater number of land owners than would have been possible without their assistance: since April 1, 1934, camps have been operated at 542 different locations in 39 States, while in the same period it has been possible to set up only 175 watershed demonstration areas. Camps have been placed at strategic points in sections where an erosion problem exists and where farmers were interested in cooperating with the Service in the checking of erosion by proper planning and practice.

Due to the nature of soil conservation work it has been difficult at times to find suitable employment for the more northern C. C. C. camps during winter months, but of late field officials have devised plans which promise to make this condition much more satisfactory. Stream-bank protection, woodland improvement, accumulation of materials for structures and fences, highway erosion-control demonstration, quarrying, fence building, clearing and cleaning for strip cropping and pasture improvement, protection

¹ Acting Assistant to the Chief, in charge of C. C. C. operations, Soil Conservation Service, Washington, D. C.

of wildlife—these are some of the operations which are to be stressed in the effort to make better use of enrollee labor during winter months.

There is no doubt whatever that thus far the association between the Civilian Conservation Corps and the Soil Conservation Service has proved mutually advantageous. While the camps constitute an invaluable contribution to the advancement of soil and water conservation, the training received by enrollees is extremely beneficial to them as individuals. Thousands of young men who came from farms have had the opportunity to learn sound farm planning and the application of approved conservation practices; this experience is certain to be put to practical use on the home farms. (Read Walter V. Kell's story, "New Life for the Old Farm," in the September 1937 issue of *SOIL CONSERVATION*.) Additional thousands of boys have received work training making them more employable and enabling them in many instances to secure jobs either within the Service or with commercial or industrial concerns. Many enrollees have become proficient in machine operation, truck driving, concrete work, drafting, use of instruments, plane-table work. A great many of our labor foremen, and some of our camp superintendents and camp technicians, are former enrollees. The establishment of conservation districts undoubtedly will afford employment in various phases of the work to outstanding enrollees. Already some of our boys have been employed by large landowners to assist in instituting soil-conservation practices.

The Service is justly proud of its C. C. C. safety record—the number of accidents has followed a continuous downward trend since January of 1936 when the records were begun. In that month the number of lost-time accidents in camps working under supervision of the Service was 4.63 per 1,000 enrollees; by September 1937 the frequency rate had been reduced to 1.53 per 1,000 enrollees. For the Corps as a whole the record shows a frequency rate of 18.0 per 1,000 enrollees for September 1934, and this was decreased to 9.5 by June of 1937. Calculation for the whole Corps is based on a 24-hour day, 7-day week exposure.

There is one very important type of work performed by the C. C. C. camps which does not affect directly the program of the Service. This is the emergency and rescue work, and every year the enrollees of our camps respond to calls of this kind in various areas. The great service rendered during the disastrous Mississippi and Ohio floods is well known. During those perilous times enrollees found many lost persons and rescued many others from drowning and freezing. They opened roads to permit transportation of doctors

to those who were sick in snowbound homes and supplies of food to those in danger of starving. In some instances these opened roads established communication for whole communities which were snowbound and in danger.

While the technical service supervisory personnel is entirely responsible for the C. C. C. work program, there are other aspects of camp administration which are essential elements in the successful achievements of the organization. Enrollees must be housed, clothed, and fed. Health must be safeguarded. Enrollees must be taught the necessity of sanitation and how to live as members of a closely related group. Fortunately for the Corps, all these indispensable phases are handled by the United States Army personnel—the fine spirit of cooperation constantly exhibited by Army officers and technical service personnel is a compliment to all concerned. It is an outstanding example of interdepartmental cooperation and is an important contributing factor to the great success attained by the Corps.

As has been stated, the cooperation and assistance of the Corps has made it possible to extend very materially the valuable work of demonstrating to landowners the importance of soil conservation. The physical contribution of the Corps can be judged to some extent by the fact that up to and including September 30, 1937, 29,518,946 man-days of C. C. C. camp labor were devoted to soil-conservation operations on farm and range lands owned by cooperators. During this time some 300,000 young men, while supporting themselves and contributing to the support of dependents, have learned how to work—have received general work training and specific instruction making them more efficient, more employable, more useful citizens.

CROP MANAGEMENT AND SOIL CONSERVATION. By Joseph F. Cox and Lyman E. Jackson. New York and London. 1937.

This new text is dedicated to the future farmers of America and is designed especially for use by teachers of agriculture and conservation of croplands. It will be a useful book for the farmer who makes up his mind that he will improve his soils and at the same time make a satisfactory living off his acres. An introductory chapter gives a general plan for instruction, and part I of the main text deals with general crop-farm management problems. The second section of the volume is devoted to directions for growing specific crops—corn, wheat and rye, oats, barley, buckwheat and flax, sorghums, soybeans and cowpeas, clovers, alfalfa and lespedeza, grasses for hay and pasture, potatoes, fieldbeans, sugar beets and other root crops, special truck crops, home food and feed crops. The appendix contains varietal recommendations, listed by States, for production and soil improvement.—P. O. F.



Digging post holes for a fence on the farm of a Soil Conservation Service cooperator. The farmer furnished the materials.

The Enrollee and Soil Conservation

By Brigadier General George P. Tyner¹

THE Civilian Conservation Corps was created to accomplish three principal objectives—the relief of unemployment, the performance of useful public work and, incidental to the first two but of no less importance, the betterment of the individual enrollee.

It is the betterment of the enrollee with which the War Department is primarily concerned—his development physically, mentally, and morally, so that upon his discharge from the Civilian Conservation Corps he will be a better citizen in every sense of the word than he was when he enrolled. With this object in view, he is given the opportunity of attending educational classes covering a wide range of subjects; he is encouraged to attend religious services regularly; he is imbued with a sense of discipline and respect for authority; and he is built up physically, by means of plentiful, substantial food and vigorous work out of doors.

The outdoor work of the enrollee, besides building him up physically, serves another valuable purpose. If the enrollee is ambitious and alive to his advantages, he is offered an excellent opportunity to learn a trade that will support him and his dependents after his discharge from the Civilian Conservation Corps.

This opportunity exists to a high degree in a Soil Conservation camp. The science of soil-erosion control is young, its exponents are pioneers, the fields open to their activities are almost limitless. An intelligent young man in a Soil Conservation camp is in

a position to acquire a trade that may readily develop into a profession. Even if a boy spends the rest of his life on his own or his father's farm, the things he has learned in a Soil Conservation camp will be of inestimable value to him. But the field is broader than that. Actual cases are known where former enrollees have gone out as experts in erosion control and have made good in a big way. As the farmers of the country come more and more to a realization of the vital importance of erosion control, the demand for authoritative guidance is increasing and will continue to increase. One of the sources—perhaps the most prolific—from which trained conservationists will come is the corps of enrollees in Soil Conservation camps. A fine opportunity confronts them. If they are alert, they will seize it.

BRITISH GRASSES AND THEIR EMPLOYMENT IN AGRICULTURE. 3rd edition. By S. F. Armstrong. Cambridge and New York. 1937.

Part I deals with the botanical aspects of the grasses and includes keys for ready reference with plants grouped according to their inflorescences and floral characters and by their seeds. The second part of the book is the agricultural section. It has been considerably enlarged to include recent research investigations on the grasses and management of grasslands. The information regarding varieties or strains and their environment and seed supply is especially adaptable to regions other than Britain and the pasture management chapters could well be studied in connection with grassland problems in the United States. Useful references are included at the ends of chapters.—P. O. F.

¹ U. S. Army, War Department representative on C. C. C. Advisory Council.

A Selecting Agency Views C.C.C. Work Opportunities

By W. Frank Persons¹

SINCE 1933 the word "conservation" has assumed new and significant meanings in our economic and social vocabulary. It is more than a mental concept: it lives and moves ahead through agencies such as the Soil Conservation Service and the Civilian Conservation Corps.

For the quarter beginning January 1, 1938, the record shows that there are 360 C. C. C. camps throughout the United States devoting themselves to soil conservation. These camps employ some 64,800 enrollees, primarily young men between the ages of 17 and 23, selected from many local communities through agencies appointed by and affiliated with the Department of Labor. These lads furnish the essential man power for the work program. The Department of Labor and its selecting agencies, equally with the Soil Conservation Service are concerned with two eventualities of camp enrollment: The accomplishments of enrollees as workers and their personal development as individuals.

In Soil Conservation camps, as in all C. C. C. camps, the conservation and development of human resources proceeds step by step with the conservation and development of land resources. The C. C. C. work program deals with the two resources and both are of fundamental importance to the national well-being.

While the Civilian Conservation Corps must continue to be "work-centered," its program should justify itself on a broader basis than mere work "production." Work on the project should be utilized to the greatest degree possible also as a means to "instruction." The basic legislation itself states that the Corps is established "for the purpose of providing employment as well as vocational training."

To an increasing extent C. C. C. applicants tend to concentrate in the lower age brackets. At present about 75 percent are less than 20 years old. This means that the youths now being selected are relatively lacking in any kind of experience which would be useful to them in obtaining normal employment. Indeed, most of them have never held any regular continuing jobs. Industry and agriculture apparently are more ready to employ the kind of young men who "graduate" from C. C. C. camps, with their months

of added maturity and experience, than the untrained youths who enter the Corps as new enrollees.

Enrollment should be, therefore, an experience whereby a youth is given a chance to develop good habits and attitudes about work, as well as an experience in which he may discover the kind of work for which he has an aptitude. It follows that the administrative and supervisory personnel on each project should accept as a primary objective the development of these enrollee attitudes and capacities to the maximum extent.

Eventually the great majority of enrollees return to the communities from which they are selected. More than half of them return to rural areas. Their gains in work experience, job morale, character, and citizenship will be noted by selecting agents, by employers, by their families and neighbors. Do C. C. C. enrollees profit as much as the land they have helped to conserve and protect? Are they more employable? The answers may depend upon the constant viewing and re-viewing of the camp work program in terms of its human resource possibilities.

Without pursuing further this underlying philosophy I should like to outline the four essential devices for making Civilian Conservation Corps work opportunities more significant and helpful to enrollees while in camp. I do this not as a technical conservationist but as an observer, on behalf of the selecting agencies, of the needs of nearly 1,800,000 young men who have had C. C. C. experience since the enterprise began.

Try-out Assignments

On every project and in every Soil Conservation camp there is a wide variety of work to be done. When a new enrollee has been properly "placed" on work for which he is suited, it is of mutual advantage both to the worker and the work program. Thus upon entering the Corps he should be given try-out assignments and the opportunity to discuss his job preferences as well as his qualifications, with the project supervisor or foreman, until the type of available work to which he is best fitted has been determined—in other words, the type of available experience which will be most profitable to him.

But, since the Corps is also a training center and its members youthful and relatively inexperienced, job assignments should not be fixed and unchangeable. A

¹ NOTE.—Mr. Persons is Director of the U. S. Employment Service and in addition has served as the representative of the Department of Labor on the Advisory Council for the Civilian Conservation Corps since the beginning of the enterprise in 1933. In this capacity he has directed the selection of more than 1,800,000 young men who have served as enrollees in the Corps.

variety of work experience useful to the enrollee should be provided—at least within certain job groupings. There should be opportunity for an enrollee to shift out into other types of jobs which the camp affords. These rotations should not be decided casually. They may well result from discussion and review of the enrollee's qualifications by camp and project officials and with the enrollee himself—reserving to the using service the making of final assignments on the work project in the best interests of all concerned including the enrollee.

Understudies

Enrollment in the Corps has never been considered permanent employment. Neither should it be a haven of refuge for those who are lacking in ambition. It is expected rather that an enrollee will apply for discharge as soon as he receives the offer of a continuing outside job which will improve his condition and which he is qualified to hold. Many of the men also will leave voluntarily and return to their homes at the end of an enrollment period. For these reasons it seems self-evident that there must always be an understudy ready to fill another's place when separations occur. Such a plan protects the work program and, indeed, protects the enrollee in that he is not tempted, when ready for available employment elsewhere, to remain in the Corps on the theory that his services are indispensable to the project.

Enrollee Personnel Records

We cannot escape the necessity of measuring and recording the "output" of the Corps as to the increased employability of its members. The Federal Government will continue its investment in the Corps as a means of training inexperienced youths through actual work, largely because the measurable results of such a work program will be commensurate with the financial cost.

It would seem essential, therefore, that there be adequate records in each project office describing the actual duties performed by an enrollee during his term of service and including a rating of his competency in each type of work. Those characteristics which go to make up job morale should also be studied and rated; for instance, adaptability to changing processes and jobs—a factor of great importance today in private employment—dependability, initiative, and like qualities. Records of this type are of equal importance, if the Corps is to promote enrollee training, with work records showing how many rods of fence have been completed, how many check dams have been built, how much terracing has been done, how

many square yards of sloping and sodding have been finished.

These personnel records should serve as a means of noting the training progress of an enrollee while in the Corps. Under established regulations, the project superintendent may also certify this record to the company commander for inclusion on the discharge certificate. A copy of the record might be forwarded, where requested, to another project superintendent if the enrollee is transferred to another company in the Corps, to a prospective employer, or to a public employment office.

The following excellent statement quoted from a recent issue of the New Hampshire State Employment Service News is in point as to the need of exact records. It is contained in an article by interviewer Paul Tracy, formerly commanding officer of a New England C. C. C. camp and thus well acquainted with the Corps:

In the next few months [Employment Service] interviewers are bound to have ever-increasing contacts with young men whose sole work experience has been in connection with the Civilian Conservation Corps. Upon the interviewer falls the duty of determining the classification for each individual for which he may be best fitted and in which there is the best opportunity of his obtaining employment . . . It can be safely said that at least 75 percent of all C. C. C. enrollees leave camp better suited and better equipped to find a job than when they first left home to enter the Civilian Conservation Corps. Hence, the task of the interviewer in registering or reinterviewing a former C. C. C. member resolves itself into two definite phases—first, a determination of the exact duty or duties performed by the young man in camp and, second, the interpretation of that work experience into the same or similar job classification in private industry.

The new emphasis being placed on the work-training program of the Civilian Conservation Corps is a tremendous advantage to the selecting agencies. It will result in greater stability of enrollee interest in the Corps and greater social dividends to the local community as the man returns to his home upon completion of his service. A further and equally important outcome will be the greater attractiveness of the Corps to new applicants. Because of the opportunities it affords, enrollment in the Corps will be coveted by all young men in the numerically eligible group. A more qualitative selection will result. Thus the work program will improve, and work production will increase in direct ratio to the appeal of the Civilian Conservation Corps to young men who now comprise its strength, as well as to those potential enrollees who now knock at the selecting agency door.

CORRECTION.—On page 220 of the February issue the picture of Boulder Dam was mistakenly described as Elephant Butte Dam.

How I Plan to Use Experience Acquired In An S. C. S.-C. C. C. Camp

By Cecil O. Giesler¹

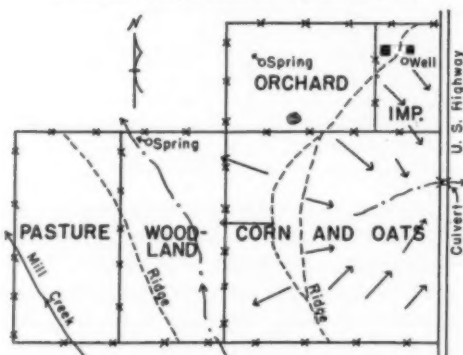


Cecil O. Giesler.

HAVING come from a farm, and since I plan to return to it when I leave the C. C. C., I consider myself very fortunate in being assigned to an S. C. S.-C. C. C. camp.

All my life I have wanted to learn more about how I could improve the handling of our small farm, but going to college was out of the question for me. I had no idea when I joined the C. C. C. that it would be my good fortune to be assigned to Camp SCS-MO-12 at Paris, Mo., where I could learn in the most practical way the very things I felt I should know to make a success of farming.

Land-use map of farm at present time.



I live on my father's farm located near Vichy, Mo., in Maries County. When I leave the C. C. C. camp, I will have 100 acres of land under my management. Because of things I have learned in camp I feel sure I can do a much better job of conserving fertility of the soil and protecting it from the serious erosion it has had to endure in the past. I feel sure I can also make better use of our land, as I have observed methods used in Monroe County on farms similar to ours where the camp has established soil and moisture conservation demonstrations on 120 farms.

I have consulted our camp agronomist, camp engineer, and camp superintendent, and have made up

¹ Enrollee in Camp SCS-MO-12, Paris, Mo.

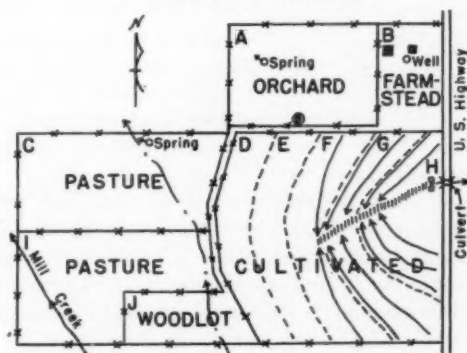
a complete land-use program which I plan to put into effect on our farm when I return to it. We have 40 acres of cropland, 20 acres of bluegrass pasture land, 20 acres of woodland, and 20 acres on which our house and barns, truck gardens, and orchard are located.

Our farm, as practically all the other farm land in that locality, is rolling to steeply rolling. I want to terrace the entire 40 acres of cropland to check erosion and to conserve moisture. We have a natural swale through the 40 to use as a terrace outlet when proper vegetation is established. I may have to build a permanent rock structure or two in this outlet, but, since I helped my foreman supervise the construction of a number of such structures, I am sure that I will know how to do that.

Since I expect to farm all my cropland on the contour, I will have to change the fence between the cropland and woodland and place it on the contour. In order to secure the necessary 5-year rotation of crops on this land, I think I should divide it into five fields of about 8 acres each and put such fences on the contour also. I have observed, and Monroe County

(Continued on p. 246)

Land-use map of farm as planned by Cecil O. Giesler, C. C. C. enrollee.



Fields:	Acres
A.....	13
B.....	6
C.....	17
D.....	8
E.....	8
F.....	8
G.....	8
H.....	8
I.....	17
J.....	5
Barnlot, etc.....	2
Total.....	100

Enrollee Aid In Northeastern Orchards

By James A. Seaman¹

SEVERAL of the Region 1 projects of the Service are located in important fruit-growing sections. During the last 3 years a great deal of work has been done on these projects to apply erosion-control methods to orchards.

Generally the orchards are classed as sod orchards or clean-tilled orchards, and both types present separate erosion-control problems. Added to this, other factors such as slope, soil type, and amount of rainfall enter into the picture. The complexity of the problem calls for many different control practices and provides a variety of work for the C. C. C. enrollees working under the direction of the Service.

A good sod in an orchard is a big step toward the control of erosion. With this in view the C. C. C. boys have been quarrying limestone to be pulverized and burned and later used on the soil by the cooperator who wants to establish and maintain a good sod on his orchard land. On some farms, due to the steepness of slope or to slope causing a concentration of water, or to poor turf, it is necessary to build diversion ditches or terraces to intercept the water and carry it to a place where it will do no damage. Many of the diversion terraces are built by machines manned by enrollees who are trained to do the work and are kept constantly at it. In some orchards, because of the nearness of the ditches to fruit trees, portions of the ditches must be built by hand.

The clean-tilled orchard is a more serious problem and, except for the use of single and double annual crops, erosion must be controlled almost entirely by engineering structures such as diversion terraces, contour furrows, outlets, and check dams. In established orchards this work usually is imperative and it presents a very difficult study to the engineers in laying out their structures so that it will not be necessary to remove many trees.

In the clean-tilled orchards the C. C. C. enrollees build check dams, terraces, diversion ditches, and outlets. To heal gullies, temporary check dams ordinarily are used, but it is often necessary to construct permanent masonry dams in drainage ways to take care of the run-off. Where it is possible the diversion ditches and terraces are built by machinery; in established orchards, however, it is often necessary to resort to hand work. Also, where possible, the terraces and diversion ditches are emptied into natural channels; but otherwise waterways or outlets must

be built and protected with a heavy sod. Where the slope is too great for sod protection the outlets are ripped or paved with stone.

Most orchards are planted on the square, rectangular, or hexagonal system, causing some rows to run up and down hill. The Soil Conservation Service is now advocating and including in the cooperative agreements a new system of planting orchards. It is the contour system. The field to be planted is laid out by the engineer assisted by the C. C. C. enrollees. All trees are planted on the contour. The engineering structures can be built either before or after the trees are planted. Any cultivation operations in an orchard planted in this manner can be done on the contour and, instead of harrow marks running up and down hill as insipient gullies they, with the small furrows, are on the level where they retard the downward flow of water. After a few years of cultivation, a bench forms between each row of trees, and this aids further in retarding the run-off and gives soil more time to take up the water.

In established orchards, most of the work is done in the late fall, winter, and early spring. This is an advantage both to the fruit grower and to the Service. When the trees are dormant there is less damage done by the workers and, at the same time, there is less interference with the grower's work. Most of the orchard improvement work in which the C. C. C. participates is done in the winter when other farm operations are at a standstill.

FOREST BIBLIOGRAPHY TO 31ST DECEMBER 1933. University of Oxford. 1937.

Parts I and II of a bibliography series of forestry and silviculture articles, annals, memoirs, manuals, technical publications, etc. Comprising literature appearing throughout the past century and now contained in the library of the department of forestry, Oxford University, England. Part I: General forestry, classified by countries, and silviculture in general and silviculture of seed and seedlings. Part II: Continuing the subject of silviculture under the headings: (1) Natural reproduction, (2) Artificial reproduction, (3) Tending, (4) Silvicultural systems, (5) Notes on trees. Brief particulars characterizing contents of all articles are appended—an important time-saving feature. The bibliography will be extremely valuable to students and organizations engaged in solving the problems of forestry and to research ecologists.

—P. O. F.

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Pioneers of Today

By Ivy M. Howard¹



Planting willow slips for living dams to replace wire checks after they have served their purpose.

POST OFFICE OAK and Council Oak, two great trees standing only a few rods apart in what is now Council Grove, Kans., have witnessed a strange pageant—more than a century of American development. Indian arrows have whistled through their boughs, speeding to the hearts of early settlers. The first school for white children in what is now Kansas, was located within a stone's throw of the trees. A city was built around them. Babies crying for food because of drought have been cooled in the shadows of the mighty oaks. Flood waters from the Neosho have marked these great trees with dirt rings. Today the well-preserved old oaks whistle tunes of many cadences—some stirring, some mournful—but in the evenings they grow still, listening to the earnest conversations of passing C. C. C. boys who talk of erosion control and moisture conservation—new topics for the ancient trees.

Under Post Office and Council Oaks has passed many times Herschel M. Klotz, 24-year-old farm youth from Chase County. But after March 31, the oaks

will hear his voice no more. Then Klotz will go back to the farm whence he came. He will go back with new knowledge of soil conservation and a determination to put into use many of the erosion-control practices he has learned in the 2 years of camp life.

THAT things happen and happen fast in C. C. C. camps is shown by a statement from Klotz. "It was Saturday when I reached camp, and Monday at noon the assistant camp engineer came into the barracks and asked if any of us knew how to do survey work. No one did. I spoke up and asked if he would teach me and let me take a place on the survey crew. That's how I happened to get on the crew so soon."

Drought with its subsequent low yields made it necessary for Klotz to enter a C. C. C. camp, but he says in all sincerity that his main reason for enrolling was to learn how to control erosion.

"Before coming to the camp," the youthful conservationist says, "I spent many days hauling rock to gullies and piling them so the centers of the checks would be highest. Now I know that the center of a gully check should always be lowest. Before I came to the camp I thought a terrace should be built and an outlet provided later. Now I know the outlet must come first."

For an hour Klotz enumerated things he has learned about soil conservation as an enrollee in the Council Grove Soil Conservation Service C. C. C. camp. He told of attending educational classes where erosion-control practices were taught, of reading books and Bulletins on soil conservation and of bumping into problems in the field that taught him much. Klotz, like thousands of other boys, is proud of his knowledge—knowledge that was not available in the younger days of the Post Office Oak and the Council Oak.

PIONEERS indeed are the C. C. C. enrollees who are fighting erosion in the Great Plains States. Trails blazed by them will be followed for generations. The work, while valuable to the farmers on whose land it is done, will be even more so to the farmers' children and their children's children. In Oklahoma alone, 2,000,000 acres, once cultivated, now lie bare and abandoned—so riddled by gullies that the Indians who once claimed the land as a happy hunting ground would now find it useful only as a burying ground. The work the C. C. C. boys are doing in demonstrating effective methods of erosion control promises to save additional millions of acres of land from the same fate.

North from the Santa Fe Trail to the northern boundary of Nebraska and south to the Oklahoma-Texas line enrollees of the 44 C. C. C. camps under the

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supervision of the Soil Conservation Service are engaged in putting on demonstrations of erosion control practices in limited areas, just as is being done on project areas. The work is the same that is being done on projects; the results are in every way comparable to those on demonstration erosion control projects; and the number of persons who visit the C. C. C. demonstrations in Region 7 is far greater than those who visit project areas. In 1937 more than 50,000 farmers left their work to see farm pond dams ripped up by C. C. C. boys; to observe the effects of contour pasture furrows and ridges the boys had helped build; to discuss the advantages of terraces, contour rows, and strip cropping for which C. C. C. boys had surveyed lines; to examine gully checks made by the enrollees—in short to see complete programs of erosion control made possible by the unflagging efforts of boys who are learning to conserve America by conserving soil and moisture.

In the Pawnee City, Nebr., camp, a camp with an outstanding educational and work program, the foremen use cooperative agreements as textbooks in teaching soil conservation to the enrollees who are working on the farms. This ensures the boys practical as well as scientific training in solving problems of soil and water conservation on farms.

The two old oaks hear conversations and learn that most of the new enrollees are from farms to which, in the beginning, they hope never to return. But the boys are sent to eroding farms where they work day after day and gradually grasp the significance of the methods. Stretching barbed wire around the gullied areas they find more than mere employment for which they are paid \$30 per month with food, clothes, and shelter. They learn that their work means cooperation with Nature. They are helping to make of the abused land a haven for wildlife and a source of income for future generations. They see good reasons for doing other types of work too, and were the oaks articulate they would say that soon after the boys enter camp they are talking about methods that can be applied on their own farms; and that when enrollment periods expire thousands, like Klotz, actually go home to use and teach others to use soil- and moisture-conservation practices in their own communities.

Appreciation of the value of erosion-control work among enrollees is well demonstrated by the course of action pursued by Otis U. Rich, a member of the Ottawa, Kans., veterans' camp. In November 1936 Rich spent his bonus for a farm—an 80-acre farm located on the Soil Conservation Service demonstration erosion-control project in Franklin County, Kans.

Immediately he contacted the Soil Conservation Service technical men and asked that a 5-year program of erosion control be worked out for the farm. A program was promptly outlined and Rich started using soil- and moisture-saving practices. In 1937 every row on the Rich farm was on the contour; a good crop rotation was started; pasture land was protected from fire and overgrazing; and a farm pond was built, with a 235-acre watershed protected by grass and terraces.

"Working in a camp engaged in erosion control made me realize the value of the work," Rich says. "Before I entered the camp I knew something should be done to control erosion on farms, but I did not know just what. Now I realize that contour farming, the use of soil-holding crops, terraces where needed, and gully control by means of diversion ditches are all steps that help hold soil."

Civilian Conservation Corps workers of Region 7 are contributing to soil conservation in three major ways:

- (1) They are doing work on individual farms that will reduce soil losses on those farms;

- (2) They are demonstrating erosion-control practices so that others may see the value of conserving soil and moisture;

- (3) They are learning fundamentals of erosion control and taking the knowledge back to their own communities and to places far remote from any demonstration area.

That these pioneers of soil saving are in demand is indicated by repeated requests received by camp superintendents to recommend boys for farm work. Here is a specific example chosen from hundreds that might be cited: A farmer near Madison, Nebr., asked the superintendent of the Madison Soil Conservation Service C. C. C. camp to send to him a boy who could establish soil-conservation work on his farm. Harold Carlson was recommended. He went to the farm at a salary of \$65 a month. That was about a year ago. Now Carlson is married and in addition to the \$65 per month his house, fuel, milk, and meat are furnished—proof enough that the soil-conservation work Carlson is doing on the farm has the approval of the farm owner.

In Blackwell, Okla., an owner of many farms insists that her tenants and farm hands be C. C. C. boys who have been in camp one or more enrollment periods. The boys know how to take care of her farms and they become long-time lessees, she points out. In other camp areas, there is the same demand for C. C. C. boys on farms.

Also there is a field for the better-trained boys in agricultural leadership. Paul Pittman of Garfield



Planting trees in contour rows on slope which is to be retired to woodland.

County, Okla., is an example. When he left camp he learned that the Garfield County agricultural agent was swamped with requests for lines for contour farming and for terraces. Having served as a member of a survey crew in camp, Pittman knew he could do the work the farmers wanted done. He went out to see some of them. They said they would be glad to pay him the same salary, for half-time work, that he had received while in camp for full-time work. This sent Pittman on his way to agricultural leadership and marked another contribution on the part of the C. C. C. to soil conservation.

White and black, old and young, enrollees of C. C. C. camps in Oklahoma, Kansas, and Nebraska are making definite contributions to soil conservation as they

pioneer in the field of erosion control. They come to camps from scattered areas, learn erosion-control practices, and take their knowledge to their home communities. Records of the birthplaces of veteran enrollees of the Ottawa, Kans., camp show that the men came from 22 States and three foreign countries. In other camps similar records are found.

The assistance which C. C. C. enrollees have given farmers of Region 7 in building many miles of terraces, riprapping dams of farm ponds, and in doing many other important soil-conservation jobs constitutes only a small part of their contribution. The greatest work of all, results of which will outlive both the Council and Post Office Oaks, is that of learning and teaching erosion-control practices.

TO USE EXPERIENCE

(Continued from p. 242)

farmers testify, that contour farming certainly saves soil and increases the yield because of the saving of moisture.

Before planning my crop rotations, I'll consult the farm agent of my county, but my own idea is that by dividing the 40 acres into five fields, I could run a 5-year crop rotation of corn, oats, wheat 1 year each, then sweetclover, lespedeza, timothy, and possibly some red top, for 2 years. I hope to be able to lime this 40 acres and to fertilize it at the rate of 200 pounds of phosphate fertilizer per acre on winter small-grain seedings to increase the yield and to help establish the grass seeding.

I shall divide the 20 acres of pasture into two fields so that I can rotate the grazing and prevent overgrazing. I also intend to mow them in June and August to help control weeds and buckbrush. In the spring, I shall add about 10 pounds of lespedeza disked in, using some fine lime with this, if I can get it. I plan

to do all I can to improve our pastures because I think that, if handled right, the pasture land may return the greatest net profit.

Having learned in camp that proper woodland management can add much value to a farm, I shall do what no one has been paying much attention to in my part of the country—that is, give protection to the growing timber. I shall select a portion of the best timber and fence it off and take care of it as I would any other farm crop. I intend to keep livestock away from it, protect it from fire, and select the trees I cut for fuel, leaving the better trees to provide posts and necessary sawlogs for farm use in coming years.

I have also learned something about keeping farm accounts while in the C. C. C. camp and I am going to ask the extension service of the Missouri College of Agriculture to provide me with the necessary farm-account forms so that I can keep close record of my farming business.

I may have some difficulty in financing all my plans, but I am determined to carry them out, if possible.